


U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTORNEY'S DOCKET NUMBER 1454.1220 <div style="font-size: 1.5em; font-weight: bold;">10/049380</div>
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		
INTERNATIONAL APPLICATION NO. PCT/DE00/02603	INTERNATIONAL FILING DATE 3 August 2000	PRIORITY DATE CLAIMED 12 August 1999
TITLE OF INVENTION METHOD FOR DETECTING THE POSITION OR THE SURFACE STRUCTURE OF AN OBJECT, AND APPLICATION OF THE METHOD AS WELL AS A MACHINE FOR TREATING OBJECTS		
APPLICANT(S) FOR DO/EO/US Dietmar SCHUETZ		
<p>Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:</p> <ol style="list-style-type: none"> 1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input checked="" type="checkbox"/> This is an express request to immediately begin national examination procedures (35 U.S.C. 371(f)). 3. <input checked="" type="checkbox"/> The US has been elected by the expiration of 19 months from the priority date (PCT Article 31). 4. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2)) <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 5. <input checked="" type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)). 6. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)) <ol style="list-style-type: none"> a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 7. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)). 8. <input checked="" type="checkbox"/> An oath or declaration of the inventor (35 U.S.C. 371(c)(4)). 9. <input type="checkbox"/> A translation of the Annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). <p>Items 10-15 below concern document(s) or information included:</p> <ol style="list-style-type: none"> 10. <input checked="" type="checkbox"/> An Information Disclosure Statement Under 37 CFR 1.97 and 1.98. 11. <input checked="" type="checkbox"/> An assignment document for recording. Please mail the recorded assignment document to: <ol style="list-style-type: none"> a. <input checked="" type="checkbox"/> the person whose signature, name & address appears at the bottom of this document. b. <input type="checkbox"/> the following: 12. <input checked="" type="checkbox"/> A preliminary amendment. 13. <input checked="" type="checkbox"/> A substitute specification 14. <input type="checkbox"/> A change of power of attorney and/or address letter. 15. <input checked="" type="checkbox"/> Other items or information: <p>PCT EASY forms filed with International Application, copy of cover page of International Application as published, International Search Report, and International Preliminary Examination Report.</p>		

<input checked="" type="checkbox"/> The U.S. National Fee (35 U.S.C. 371(c)(1)) and other fees as follows:					
CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS	8 -20=	0	x \$ 18.00	0.00
	INDEPENDENT CLAIMS	2 -3=	0	x \$ 84.00	0.00
	MULTIPLE DEPENDENT CLAIM(S) (if applicable)			+\$280.00	0.00
	BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(4): <input type="checkbox"/> Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO\$1,040 <input checked="" type="checkbox"/> International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO.....\$ 890 <input type="checkbox"/> International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO...\$ 740 <input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provision of PCT Article 33(1)-(4).....\$ 710 <input type="checkbox"/> International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2) to (4)\$ 100				890.00
	Surcharge of \$130 for furnishing the National fee or oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 mos. from the earliest claimed priority date (37 CFR 1.482(e)).				0.00
	TOTAL OF ABOVE CALCULATIONS				890.00
	Reduction by 1/2 for filing by small entity, if applicable. Affidavit must be filed also. (Note 37 CFR 1.9, 1.27, 1.28.)				
	SUBTOTAL				890.00
	Processing fee of \$130 for furnishing the English Translation later than [] 20 [] 30 mos. from the earliest claimed priority date (37 CFR 1.482(f)).				
	TOTAL NATIONAL FEE				890.00
	Fee for recording the enclosed assignment (37 CFR 1.21(h)).				+ 40.00
	TOTAL FEES ENCLOSED				930.00
a. <input checked="" type="checkbox"/> A check in the amount of \$930.00 to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. 19-3935 in the Amount of \$ to cover the above fees. A duplicate copy of this sheet is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 19-3935. A duplicate copy of this sheet is enclosed.					
 21171 PATENT TRADEMARK OFFICE					
SUBMITTED BY: STAAS & HALSEY LLP					
Type Name	Richard A. Gollhofer			Reg. No.	31,106
Signature	<i>Richard A. Gollhofer</i>			Date	2/12/02

Docket No.: 1454.1220

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the Application of:

Dietmar SCHUETZ

Serial No.

Group Art Unit: (unassigned)

Confirmation No.

Filed: (concurrently)

Examiner: (unassigned)

For: METHOD AND APPARATUS FOR DETECTING POSITION OR SURFACE
STRUCTURE OF AN OBJECT (as amended)

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Before examination of the above-identified application, please amend the application as follows:

IN THE TITLE:

Please DELETE the Title in its entirety and REPLACE with the following new Title.

-- METHOD AND APPARATUS FOR DETECTING POSITION OR SURFACE
STRUCTURE OF AN OBJECT--.

IN THE SPECIFICATION:

Please REPLACE the pending specification with the substitute specification attached hereto.

IN THE CLAIMS:

Please cancel without prejudice or disclaimer claims 1-6 in the underlying PCT application and ADD new claims 7-14 in accordance with the following:

7. (NEW) A method for detecting at least one of position and surface structure of an object, comprising:

placing the object immediately above an array of capacitive sensors, each having an outer surface with a lateral extent of at most half of a lateral extent of the object; and

electronically evaluating a capacitive disturbance of the outer surface of at least one individual sensor caused by said placing.

8. (NEW) The method as claimed in claim 1, further comprising forming an image of the object.

9. (NEW) The method as claimed in claim 8, wherein the array is a capacitive fingerprint sensor formed of a semiconductor.

10. (NEW) The method as claimed in claim 9, wherein said evaluating detects at least one of the position and surface structure of a mechanical workpiece.

11. (NEW) The method as claimed in claim 9, wherein said evaluating detects at least one of the position and surface structure of an electric component

12. (NEW) The method as claimed in claim 11, wherein said evaluating detects at least one of the position and surface structure of terminal pins of the electric component.

13. (NEW) The method as claimed in claim 11,
wherein said evaluating detects the position and the orientation of the terminal pins of the electric component in an automatic component mounting machine that has a machine tool and a component provider, and

wherein the array is integrated in at least one of the component provider and the machine tool.

14. (NEW) An apparatus for processing objects with a tool for providing the objects and a tool for transporting the objects, comprising:

a fingerprint sensor, integrated in at least one of the tools, to detect at least one of a position and a surface structure of the objects.

IN THE ABSTRACT:

Please DELETE the Abstract in its entirety and replace with the attached Substitute Abstract.

REMARKS

This Preliminary Amendment is submitted to improve the form of the English translation as filed. It is respectfully requested that this Preliminary Amendment be entered in the above-referenced application.

In accordance with the foregoing, claims 1-6 have been canceled and claims 7-14 have been added. Thus, claims 7-14 are pending and are under consideration.

A substitute specification is also being filed herewith. The substitute specification is accompanied by a marked-up copy of the original specification.

If there are any questions regarding these matters, such questions can be addressed by telephone to the undersigned. Otherwise, an early action on the merits is respectfully solicited.

If any further fees are required in connection with the filing of this Preliminary Amendment, please charge same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 2/12/02

By: Richard A. Gollhofer
Richard A. Gollhofer
Registration No. 31,106

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Washington, D.C. 20001
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SUBSTITUTE SPECIFICATION

TITLE OF THE INVENTION

METHOD AND APPARATUS FOR DETECTING POSITION OR SURFACE STRUCTURE OF
AN OBJECT

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is based on and hereby claims priority to German Application No. 19938062.7 filed on August 12, 1999, the contents of which are hereby incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] The invention relates to a method for detecting the position or the surface structure of an object, an image of the object being generated. The invention also relates to the use of the method.

[0003] Machine tools, in particular automatic component mounting machines, place stringent requirements on accuracy during the detection, handling and processing of workpieces or components. An important problem in this is inaccuracies in the provision of the workpieces/ components, which arise, for example, from a necessary play between the component and component support. These inaccuracies are generally larger than the required maximum final inaccuracy, and must therefore be corrected in the course of being processed. In particular, in addition to determining the position of the workpiece or component, it is desirable to detect whether it is damaged on the outside and must therefore be excluded straight away from further processing.

[0004] Methods for detecting workpieces/components are known which scan the latter optically and compose a corresponding two-dimensional image containing information from the third dimension (depth information). The optical sensors required for this purpose are complicated and expensive to produce. Because of their complicated design, they are difficult to integrate and can therefore be arranged only at specific stations in the processing cycle from the provision of the component up to final placement.

[0005] Consequently, these known methods are typified by subsequent correction, for example of the position of the component, or the rejection of the component as scrap. This procedure leads to not inconsiderable time losses, particularly in the case of automatic component mounting machines. Furthermore, the optical scanning of the workpieces delivers a two-dimensional image with a plenitude of information from the third dimension as well, which is not needed at all in most cases. What is important in essence is to check the position of a workpiece. Moreover, in the case of automatic component mounting machines it is necessary to inspect those parts of the component that later come to lie in the plane of the printed circuit board. An example of this would be the detection of a bent terminal pin of an electric component.

[0006] Moreover, capacitive fingerprint sensors are known which, by scanning the surface of a finger, generate an image of the fingerprint that can be used to identify a person. These sensors are easy and inexpensive to produce with the aid of silicon technology and can be integrated, in addition. Such sensors are disclosed, for example, in U.S. Patent No. 4,353,056.

SUMMARY OF THE INVENTION

[0007] It is the object of the present invention to provide a method for detecting the position or the surface structure of an object in the case of which a sensor that can be produced easily and inexpensively is used to generate an image of the object that for the most part contains only the relevant information.

[0008] The invention specifies a method for detecting the position or the surface structure of an object, the object being placed on or right over an array of capacitive individual sensors. The lateral extent of the individual sensors may in this case be at most half the lateral extent of the object to be detected. At least one of the capacitive individual sensors experiences a capacitive disturbance at its surface through the presence of the object. This disturbance of one or more individual sensors is evaluated electronically and processed to form an image of the object.

[0009] As a result of the placement according to the invention of an object on or right over an array of capacitive individual sensors, the image, delivered by the array, of the object contains only a small amount of depth information on the parts of the object that are located near the sensor. The point is that with increasing distance from the capacitive sensor the capacitive disturbance becomes so slight that it can be detected only weakly, or even no longer. Furthermore, disturbances in the image processing owing to lighting problems or inhomogeneous

backgrounds are eliminated. The components near the sensor emerge clearly in the image, while elements further removed which therefore are also situated outside the plane of the printed circuit board, for example, appear less clearly or not at all. In addition, in the simplest case a capacitive sensor is an arrangement of individual capacitors that can be realized easily and cost-effectively.

[0010] It is particularly advantageous to use a capacitive fingerprint sensor based on a semiconductor as the array of capacitive individual sensors. In this case, the capacitive individual sensors are field effect transistors. Such a sensor can be produced cost-effectively and in an integrated fashion using the means of silicon technology.

[0011] The method according to the invention is suitable, in particular, for applications in which the surface structure or position of a mechanical workpiece or an electric component as object is detected. Particularly in the case of electric components, the method according to the invention is suitable for detecting the position and the orientation of terminal pins, since here there is a need only for the information on the plane of the printed circuit board provided for the component.

[0012] The method according to the invention is particularly well suited for application in automatic component mounting machines that have a machine tool and a component provider. The fingerprint sensors, which can easily be integrated, can be mounted straight away at the component provider or in the machine tool. This renders it possible to check the position and the orientation of terminal pins of electric components at the very beginning of the processing cycle, such that it is possible to dispense with subsequent corrections. In addition, it is possible thereby to exclude defective components, for example those with broken off or bent terminal pins, at once without unnecessarily losing cycle time for a defective component.

[0013] If appropriate, it is also possible to integrate in the automatic component mounting machines further similar or different sensors, for example for detecting the surface structure of the front and rear sides or for simultaneously detecting position and surface structure.

[0014] The invention also specifies a machine for processing objects which has a tool for providing the objects and a tool for transporting the objects. Integrated in one or both tools is an array of capacitive individual sensors that detects the position and/or the surface structure of the objects in accordance with the method described above.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] These and other objects and advantages of the present invention are explained in more detail below with the aid of an exemplary embodiment and the associated figures, in which:

Figure 1 is a plan view of an object that is placed according to the invention over a fingerprint sensor, and

Figure 2 is a cross section of the object of Figure 1 placed over a fingerprint sensor.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0016] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout.

[0017] Figure 1 shows an electric component 3 with terminal pins 4, which is positioned over a sensor array 1. The sensor array 1 consists of a plurality of capacitive individual sensors 2. The lateral extent of the capacitive individual sensors 2 is substantially smaller than the lateral extent of electric component 3. This ensures that an image of the electric component 3 of adequate resolution is produced.

[0018] Figure 2 shows an electric component 3 with terminal pins 4 that is arranged right next to a sensor array 1. The sensor array 1 consists of capacitive individual sensors 2. Connected to the sensor array is an electronic evaluation system 5 with downstream image processing 6. When applied to the detection of the orientation of terminal pins of electric components, the method according to the invention can be used, for example, to detect the bent away terminal pin illustrated at the bottom in Figure 2 and to exclude the electric component 3 from the further processing cycle as scrap.

[0019] The invention has been described in detail with particular reference to preferred embodiments thereof and examples, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention.

SUBSTITUTE ABSTRACT

METHOD AND APPARATUS FOR DETECTING POSITION OR SURFACE STRUCTURE OF AN OBJECT

The position or surface structure of an object is detected with the aid of an array of capacitive individual sensors, the object being positioned on or right over the array. The method is particularly useful in automatic component mounting machines for detecting position and orientation of the terminal pins of an electric component. The sensor array used in the method is produced using semiconductor fabrication and does not require accessory units such as an optical system.

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- 1 -

Description

Method for detecting the position or the surface
5 structure of an object, and application of the method
as well as a machine for processing objects

The invention relates to a method for detecting the
position or the surface structure of an object, an
10 image of the object being generated. The invention also
relates to the use of the method.

Machine tools, in particular automatic component
mounting machines, place stringent requirements on
15 accuracy during the detection, handling and processing
of workpieces or components. An important problem in
this is inaccuracies in the provision of the
workpieces/components, which arise, for example, from a
necessary play between the component and component
20 support. These inaccuracies are generally larger than
the required maximum final inaccuracy, and must
therefore be corrected in the course of being
processed. In particular, in addition to determining
the position of the workpiece or component, it is
25 desirable to detect whether it is damaged on the
outside and must therefore be excluded straight away
from further processing.

Methods for detecting workpieces/components are known
30 which scan the latter optically and compose a
corresponding two-dimensional image containing
information from the third dimension (depth
information). The optical sensors required for this
purpose are complicated and expensive to produce.
35 Because of their complicated design, they are difficult
to integrate and can therefore be arranged only at
specific stations in the processing cycle from the
provision of the component up to final placement.

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Consequently, these known methods are typified by subsequent correction, for example of the position of the component, or the rejection of the component as scrap. This

procedure leads to not inconsiderable time losses, particularly in the case of automatic component mounting machines. Furthermore, the optical scanning of the workpieces delivers a two-dimensional image with a plenitude of information from the third dimension as well, which is not needed at all in most cases. What is important in essence is to check the position of a workpiece. Moreover, in the case of automatic component mounting machines it is necessary to inspect those parts of the component that later come to lie in the plane of the printed circuit board. An example of this would be the detection of a bent terminal pin of an electric component.

Moreover, capacitive fingerprint sensors are known which, by scanning the surface of a finger, generate an image of the fingerprint that can be used to identify a person. These sensors are easy and inexpensive to produce with the aid of silicon technology and can be integrated, in addition. Such sensors are disclosed, for example, in US 4,353,056.

It is the object of the present invention to provide a method for detecting the position or the surface structure of an object in the case of which a sensor that can be produced easily and inexpensively is used to generate an image of the object that for the most part contains only the relevant information.

This object is achieved according to the invention by a method as claimed in claim 1. Advantageous refinements of the invention and applications of the invention as well as a machine that uses the invention are to be gathered from the further claims.

The invention specifies a method for detecting the position or the surface structure of an object, the object being placed on or right over an array of

capacitive individual sensors. The lateral extent of
the

individual sensors may in this case be at most half the lateral extent of the object to be detected. At least one of the capacitive individual sensors experiences a capacitive disturbance at its surface through the presence of the object. This disturbance of one or more individual sensors is evaluated electronically and processed to form an image of the object.

As a result of the placement according to the invention of an object on or right over an array of capacitive individual sensors, the image, delivered by the array, of the object contains only a small amount of depth information on the parts of the object that are located near the sensor. The point is that with increasing distance from the capacitive sensor the capacitive disturbance becomes so slight that it can be detected only weakly, or even no longer. Furthermore, disturbances in the image processing owing to lighting problems or inhomogeneous backgrounds are eliminated. The components near the sensor emerge clearly in the image, while elements further removed which therefore are also situated outside the plane of the printed circuit board, for example, appear less clearly or not at all. In addition, in the simplest case a capacitive sensor is an arrangement of individual capacitors that can be realized easily and cost-effectively.

It is particularly advantageous to use a capacitive fingerprint sensor based on a semiconductor as the array of capacitive individual sensors. In this case, the capacitive individual sensors are field effect transistors. Such a sensor can be produced cost-effectively and in an integrated fashion using the means of silicon technology.

The method according to the invention is suitable, in particular, for applications in which the surface structure or position of a mechanical workpiece or an

electric component as object is detected. Particularly in the case of electric components, the method according to the invention is suitable for

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detecting the position and the orientation of terminal pins, since here there is a need only for the information on the plane of the printed circuit board provided for the component.

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The method according to the invention is particularly well suited for application in automatic component mounting machines that have a machine tool and a component provider. The fingerprint sensors, which can easily be integrated, can be mounted straight away at the component provider or in the machine tool. This renders it possible to check the position and the orientation of terminal pins of electric components at the very beginning of the processing cycle, such that it is possible to dispense with subsequent corrections. In addition, it is possible thereby to exclude defective components, for example those with broken off or bent terminal pins, at once without unnecessarily losing cycle time for a defective component.

20

If appropriate, it is also possible to integrate in the automatic component mounting machines further similar or different sensors, for example for detecting the surface structure of the front and rear sides or for simultaneously detecting position and surface structure.

25

The invention also specifies a machine for processing objects which has a tool for providing the objects and a tool for transporting the objects. Integrated in one or both tools is an array of capacitive individual sensors that detects the position and/or the surface structure of the objects in accordance with the method described above.

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The invention is explained in more detail below with the aid of an exemplary embodiment and the associated figures, in which:

- 4a -

Figure 1 shows a plan view of an object that is placed according to the invention over a fingerprint sensor, and

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Figure 2 shows a cross section of the object of Figure 1 placed over a fingerprint sensor.

Figure 1 shows an electric component 3 with terminal
5 pins 4, which is positioned over a sensor array 1. The
sensor array 1 consists of a plurality of capacitive
individual sensors 2. The lateral extent of the
capacitive individual sensors 2 is substantially
10 smaller than the lateral extent of electric component
3. This ensures that an image of the electric component
3 of adequate resolution is produced.

Figure 2 shows an electric component 3 with terminal
pins 4 that is arranged right next to a sensor array 1.
15 The sensor array 1 consists of capacitive individual
sensors 2. Connected to the sensor array is an
electronic evaluation system 5 with downstream image
processing 6. When applied to the detection of the
orientation of terminal pins of electric components,
20 the method according to the invention can be used, for
example, to detect the bent away terminal pin
illustrated at the bottom in Figure 2 and to exclude
the electric component 3 from the further processing
cycle as scrap.

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The invention is not restricted to the special
embodiments shown by way of example, but is defined in
its most general form by claim 1.

Patent claims

1. A method for detecting the position and/or the
5 surface structure of an object (3)
- in which the object (3) is placed on or right over an
array (1) of capacitive individual sensors (2) whose
lateral extent is at most half the lateral extent of
the object (3) to be detected,
10 - the capacitive disturbance of the surface of at least
one individual sensor (2) thereby being caused, which
is evaluated electronically and processed to form an
image of the object (3).
- 15 2. The method as claimed in claim 1, in which the array
(1) is a capacitive fingerprint sensor based on a
semiconductor.
3. An application of the method as claimed in claim 1
20 or 2, in which the position or surface structure of a
mechanical workpiece or an electric component is
detected.
4. The application of the method as claimed in claim 3
25 for detecting the position and the orientation of
terminal pins (4) of an electric component (3).
5. The application of the method as claimed in claim 3
for detecting the position and the orientation of
30 terminal pins (4) of an electric component (3) in an
automatic component mounting machine that has a machine
tool and a component provider, the fingerprint sensor
being integrated in the component provider or in the
machine tool.
- 35 6. A machine for processing objects with the aid of a
tool for providing the objects and a tool for
transporting the objects, in which there is integrated

in one or both tools a fingerprint sensor which detects the position and/or the surface structure of the objects.

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Abstract

Method for detecting the position or the surface structure of an object, and application of the method as well as a machine for processing objects

The invention relates to a method for detecting the position or the surface structure of an object (3) with the aid of an array (1) of capacitive individual sensors (2), the object (3) being positioned on or right over the array (1). The invention also relates, in particular, to the application of the method in automatic component mounting machines for detecting position and orientation of the terminal pins (4) of an electric component (3). The sensor used in the method is produced using the means of semiconductor fabrication and manages without further accessory units such as, for example, an optical system, and is substantially more favorable to produce. The invention also relates to a machine for processing objects.

Figure 2

1/1

FIG 1

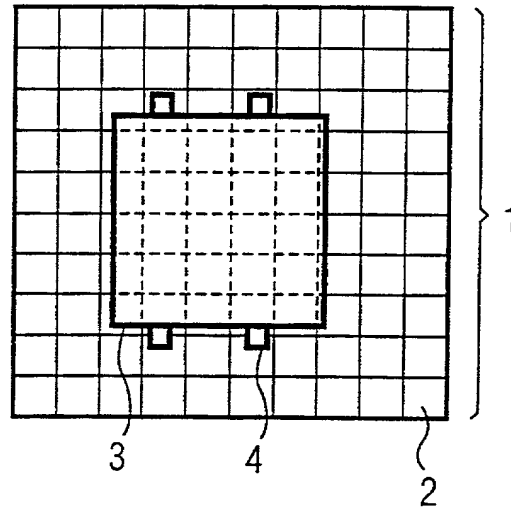
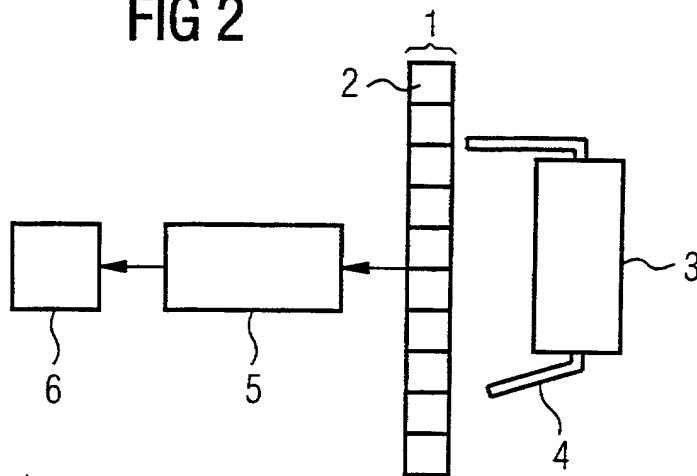


FIG 2



Patent and Trademark Office-U.S. DEPARTMENT OF COMMERCE

German Language Declaration

Prior foreign applications
Priorität beansprucht

Priority Claimed

19938062.7

DE

12.08.1999

☒

☐

(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

Yes
Ja

No
Nein

(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

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Yes
Ja

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No
Nein

(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☐
Yes
Ja

☐
No
Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/02603

(Application Serial No.)
(Anmeldeseriennummer)

03.08.2000

(Filing Date D, M, Y)
(Anmeldedatum T, M, J)

anhängig

(Status)
(patentiert, anhängig,
aufgegeben)

pending

(Status)
(patented, pending,
abandoned)

(Application Serial No.)
(Anmeldeseriennummer)

(Filing Date D,M,Y)
(Anmeldedatum T, M, J)

(Status)
(patentiert, anhängig,
aufgeben)

(Status)
(patented, pending,
abandoned)

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